

Notice of Allowability

Application No.

09/282,303

Examiner

Michael P. Mooney

Applicant(s)

BROENG ET AL.

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2877 2883

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 4/29/04 Amdt.
2. ☒ The allowed claim(s) is/are 9,10,18-25,37-40,46,47,54-58,67-70,79-86,91,92,97-100,107-109,116-121,124,127,128,131,134 and 135.
3. ☒ The drawings filed on 31 March 1999 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some* c) ☐ None of the:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date <u>4/29/04</u> | 7. <input type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

Election/Restrictions

This application is in condition for allowance except for the presence of claims 1-8, 11-17, 26-36, 41-45, 48-51, 53, 59-66, 71-78, 87-90, 101-106, 110-115, 122, 123, 125, 126, 129, 130, 132 and 133 to invention(s) non-elected without traverse in the paper filed 4/29/02. Accordingly, claims 1-8, 11-17, 26-36, 41-45, 48-51, 53, 59-66, 71-78, 87-90, 101-106, 110-115, 122, 123, 125, 126, 129, 130, 132 and 133 have been cancelled.

REASONS FOR ALLOWANCE

The following is an examiner's statement of reasons for allowance:

The prior art, either alone or in combination, does not disclose or render obvious a cladding region extending along the longitudinal direction, said cladding region comprising an at least substantially two-dimensionally periodic structure comprising primary, elongated elements each having a centre axis extending in the longitudinal direction of the waveguide, the primary elements having a refractive index being lower than a refractive index of any material adjacent to the elongated elements, the periodic structure being defined, in a cross-section perpendicular to the longitudinal direction, by a unit cell, where the sum of all areas of elongated elements, which areas are comprised within the unit cell, is larger than 1.2 times the area of that primary element having its centre axis not positioned outside the unit cell and having the largest area; and wherein the periodic structure comprises secondary elongated elements having a refractive index being larger than that of any material adjacent thereto and to any

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material being adjacent to a primary element in combination with the rest of claim 9 for the reasons stated by Applicant in the Remarks section filed 4/29/04.

It is noted that the claim 9 is allowable because the unique combination of each and every specific element stated in the claim.

The prior art, either alone or in combination, does not disclose or render obvious a cladding region extending along the longitudinal direction, said cladding region comprising an at least substantially two-dimensionally periodic structure comprising primary, elongated elements each having a centre axis extending in the longitudinal direction of the waveguide, the primary elements having a refractive index being lower than a refractive index of any material adjacent to the primary elements, the periodic structure being, in a cross-section perpendicular to the longitudinal direction, defined by a unit cell, where, in each unit cell:

$$(n_{\text{sub.d}})(\Lambda_{\text{sub.2}}) > (n_{\text{sub.}\mu\text{d}})(\Lambda_{\text{sub.1}}(\sqrt{3}))$$

where:

$n_{\text{sub.d}}$ is the largest index of refraction within a first circle which is defined as a largest circle possible having a centre not positioned outside the unit cell and not enclosing any part of any primary element,

$n_{\text{sub.}\mu\text{d}}$ is a largest index of refraction not positioned outside the unit cell but outside any of the first circles of the unit cells,

$\Lambda_{\text{sub.1}}$ is a smallest distance between centre axes of two primary elements within the periodic structure,

$\Lambda_{sub.2}$ is a distance between the centre of the first circle of the unit cell and the centre of the first circle of an adjacent unit cell

in combination with the rest of claim 18 for the reasons stated by Applicant in the Remarks section filed 4/29/04.

It is noted that the claim 18 is allowable because the unique combination of each and every specific element stated in the claim.

The prior art, either alone or in combination, does not disclose or render obvious a cladding region extending along the longitudinal direction, said cladding region comprising an at least substantially two-dimensionally periodic structure comprising primary, elongated elements each having a centre axis extending in the longitudinal direction of the waveguide, the primary elements each having a refractive index being lower than a refractive index of any material adjacent to the primary element, the periodic structure being, in a cross-section perpendicular to the longitudinal direction, defined by a unit cell, and where a polygon is defined: having centres of primary elements in its vertices, not enclosing any centres of other primary elements than those having their centres at the vertices of the polygon, and having an area less than or equal to that of the unit cell, the polygon being a regular, hexagonal polygon; and wherein the periodic structure further comprises one or more secondary elongated elements having a refractive index higher than that of any material adjacent thereto or adjacent to any primary elements, the secondary elements each has a centre axis extending in the longitudinal direction of the fibre in combination with the rest of claim 37 for the reasons stated by Applicant in the Remarks section filed 4/29/04.

It is noted that the claim 37 is allowable because the unique combination of each and every specific element stated in the claim.

The prior art, either alone or in combination, does not disclose or render obvious a cladding region extending along the longitudinal direction, said cladding region comprising an at least substantially two-dimensionally periodic structure comprising primary, elongated elements each having a centre axis extending in the longitudinal direction of the waveguide, the primary elements each having a refractive index being lower than a refractive index of any material adjacent to the primary element, the periodic structure further comprising secondary, elongated elements each having a refractive index being larger than that of any material adjacent thereto and any material adjacent to a primary element, each secondary element having a centre axis extending in the longitudinal direction of the fibre in combination with the rest of claim 54 for the reasons stated by Applicant in the Remarks section filed 4/29/04.

It is noted that the claim 54 is allowable because the unique combination of each and every specific element stated in the claim.

The prior art, either alone or in combination, does not disclose or render obvious a cladding region extending along the longitudinal direction, said cladding region comprising an at least substantially two-dimensionally periodic structure comprising primary, elongated elements each having a centre axis extending in the longitudinal direction of the waveguide, the primary elements each having a refractive index being

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lower than a refractive index of any material adjacent to the primary element, the periodic structure being, in a cross-section perpendicular to the longitudinal direction, defined by a unit cell, and where a polygon is defined: having centres of primary elements in its vertices, not enclosing any centres of other primary elements than those having their centres at the vertices of the polygon, and having an area less than or equal to that of the unit cell, the polygon being a regular, hexagonal polygon; wherein the core region comprises a first additional elongated element extending in the longitudinal direction of the fibre in combination with the rest of claim 79 for the reasons stated by Applicant in the Remarks section filed 4/29/04.

It is noted that the claim 79 is allowable because the unique combination of each and every specific element stated in the claim.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

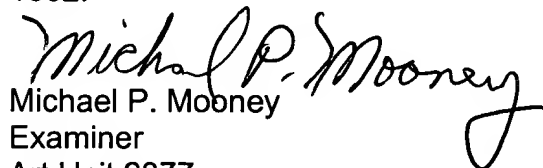
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael P. Mooney whose telephone number is 571-272-2422. The examiner can normally be reached during weekdays, M-F.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on 571-272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-1562.


Michael P. Mooney
Examiner
Art Unit 2877


Frank G. Font
Supervisory Patent Examiner
Art Unit 2877

FGF/mpm
7/8/04